

SEQUENCE LISTING

<110> Astex Technology Limited
 Cosme, Jose
 Ward, Alison
 Vuillard, Laurent
 Williams, Pamela
 Hamilton, Bruce

<120> Methods of Purification of Cytochrome P450 Proteins

<130> AHBCP6047252

<140> PCT/GB02/02668

<141> 2002-05-30

<160> 84

<170> PatentIn Ver. 2.1

<210> 1

<211> 1428

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: 2C19 (internal deletion, and His tagged) coding sequence.

<400> 1

```

atggctaaga aaacgagctc taaagggcgg cgcctggcc cactcctct cccagtgatt 60
ggaaatatcc tacagataga tattaaggat gtcagcaa ccttaaccaa tctctcaaaa 120
atctatggcc ctgtgttcac tctgtatctt ggcctggaac gcatgggtgt gctgcatgga 180
tatgaagtgg tgaaggaagc cctgattgat cttggagagg agttttctgg aagaggccat 240
ttcccactgg ctgaaagagc taacagagga tttggaatcg ttttcagcaa tggaaagaga 300
tggaaggaga tccggcgttt ctccctcatg acgctgcgga attttgggat ggggaagagg 360
agcattgagg accgtgttca agaggaagcc cactgccttg tggaggagtt gagaaaaacc 420
aaggcttcac cctgtgatcc cactttcatc ctgggctgtg ctccctgcaa tgtgatctgc 480
tccattatct tccagaaacg ttctgattat aaagatcagc aatttcttaa cttgatggaa 540
aaattgaatg aaaacatcag gattgtaagc acccctgga tccagatatg caataatctt 600
cccactatca ttgattatct cccgggaacc cataacaaat tacttaaaaa cttgctttt 660
atggaaagtg atattttgga gaaagtaaaa gaacaccaag aatcgatgga catcaacaac 720
cctcgggact ttattgattg cttcctgatc aaaatggaga aggaaaagca aaaccaacag 780
tctgaattca ctattgaaaa cttggtaatc actgcagctg acttacttgg agctgggaca 840
gagacaacaa gcacaaccct gagatatgct ctcttctcc tgctgaagca cccagaggtc 900
acagctaaag tccaggaaga gattgaacgt gtcgttggca gaaaccggag cccctgcatg 960
caggacaggg gccacatgcc ctacacagat gctgtggtgc acgaggtcca gagatacatc 1020
gacctcatcc ccaccagcct gcccacatga gtgacctgtg acgttaaatt cagaaactac 1080
ctcattccca agggcacaac catattaact tccctcactt ctgtgctaca tgacaacaaa 1140
gaatttccca acccagagat gtttgaccct cgtcactttc tgcatgaagg tggaaatctt 1200
aagaaaagta actacttcat gcctttctca gcaggaaaac ggatttgtgt gggagagggc 1260
ctggcccgca tggagctgtt tttattcctg accttcattt tacagaactt taacctgaaa 1320
tctctgattg acccaaagga ccttgacaca actcctgttg tcaatggatt tgcttctgtc 1380
ccgcccttct accagctctg cttcattcct gtccaccacc accactga 1428

```

<210> 2

<211> 475

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Protein
sequence of 2C19 coded by SEQ ID NO: 1

<400> 2

Met	Ala	Lys	Lys	Thr	Ser	Ser	Lys	Gly	Arg	Pro	Pro	Gly	Pro	Thr	Pro		
1				5				10						15			
Leu	Pro	Val	Ile	Gly	Asn	Ile	Leu	Gln	Ile	Asp	Ile	Lys	Asp	Val	Ser		
			20					25					30				
Lys	Ser	Leu	Thr	Asn	Leu	Ser	Lys	Ile	Tyr	Gly	Pro	Val	Phe	Thr	Leu		
		35					40					45					
Tyr	Phe	Gly	Leu	Glu	Arg	Met	Val	Val	Leu	His	Gly	Tyr	Glu	Val	Val		
	50					55					60						
Lys	Glu	Ala	Leu	Ile	Asp	Leu	Gly	Glu	Glu	Phe	Ser	Gly	Arg	Gly	His		
65					70					75					80		
Phe	Pro	Leu	Ala	Glu	Arg	Ala	Asn	Arg	Gly	Phe	Gly	Ile	Val	Phe	Ser		
				85					90						95		
Asn	Gly	Lys	Arg	Trp	Lys	Glu	Ile	Arg	Arg	Phe	Ser	Leu	Met	Thr	Leu		
			100					105					110				
Arg	Asn	Phe	Gly	Met	Gly	Lys	Arg	Ser	Ile	Glu	Asp	Arg	Val	Gln	Glu		
		115					120					125					
Glu	Ala	His	Cys	Leu	Val	Glu	Glu	Leu	Arg	Lys	Thr	Lys	Ala	Ser	Pro		
	130						135				140						
Cys	Asp	Pro	Thr	Phe	Ile	Leu	Gly	Cys	Ala	Pro	Cys	Asn	Val	Ile	Cys		
145					150					155					160		
Ser	Ile	Ile	Phe	Gln	Lys	Arg	Phe	Asp	Tyr	Lys	Asp	Gln	Gln	Phe	Leu		
			165						170					175			
Asn	Leu	Met	Glu	Lys	Leu	Asn	Glu	Asn	Ile	Arg	Ile	Val	Ser	Thr	Pro		
		180						185					190				
Trp	Ile	Gln	Ile	Cys	Asn	Asn	Phe	Pro	Thr	Ile	Ile	Asp	Tyr	Phe	Pro		
		195					200					205					
Gly	Thr	His	Asn	Lys	Leu	Leu	Lys	Asn	Leu	Ala	Phe	Met	Glu	Ser	Asp		
	210						215				220						
Ile	Leu	Glu	Lys	Val	Lys	Glu	His	Gln	Glu	Ser	Met	Asp	Ile	Asn	Asn		
225					230					235					240		
Pro	Arg	Asp	Phe	Ile	Asp	Cys	Phe	Leu	Ile	Lys	Met	Glu	Lys	Glu	Lys		
			245						250					255			

Gln Asn Gln Gln Ser Glu Phe Thr Ile Glu Asn Leu Val Ile Thr Ala
 260 265 270
 Ala Asp Leu Leu Gly Ala Gly Thr Glu Thr Thr Ser Thr Thr Leu Arg
 275 280 285
 Tyr Ala Leu Leu Leu Leu Leu Lys His Pro Glu Val Thr Ala Lys Val
 290 295 300
 Gln Glu Glu Ile Glu Arg Val Val Gly Arg Asn Arg Ser Pro Cys Met
 305 310 315 320
 Gln Asp Arg Gly His Met Pro Tyr Thr Asp Ala Val Val His Glu Val
 325 330 335
 Gln Arg Tyr Ile Asp Leu Ile Pro Thr Ser Leu Pro His Ala Val Thr
 340 345 350
 Cys Asp Val Lys Phe Arg Asn Tyr Leu Ile Pro Lys Gly Thr Thr Ile
 355 360 365
 Leu Thr Ser Leu Thr Ser Val Leu His Asp Asn Lys Glu Phe Pro Asn
 370 375 380
 Pro Glu Met Phe Asp Pro Arg His Phe Leu His Glu Gly Gly Asn Phe
 385 390 395 400
 Lys Lys Ser Asn Tyr Phe Met Pro Phe Ser Ala Gly Lys Arg Ile Cys
 405 410 415
 Val Gly Glu Gly Leu Ala Arg Met Glu Leu Phe Leu Phe Leu Thr Phe
 420 425 430
 Ile Leu Gln Asn Phe Asn Leu Lys Ser Leu Ile Asp Pro Lys Asp Leu
 435 440 445
 Asp Thr Thr Pro Val Val Asn Gly Phe Ala Ser Val Pro Pro Phe Tyr
 450 455 460
 Gln Leu Cys Phe Ile Pro Val His His His His
 465 470 475

<210> 3

<211> 1428

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: 2C19 wild type

1B

<400> 3

atggctaaga aaacgagctc taaagggcgg ccgcctggcc ctactcctct cccagtgatt 60
 ggaaatatcc tacagataga tattaaggat gtcagcaaat ccttaaccaa tctctcaaaa 120
 atctatggcc ctgtgttcac tctgtatattt ggccctggaac gcatgggtgtt gctgcatgga 180
 tatgaagtgg tgaaggaagc cctgattgat cttggagagg agttttcttg aagaggccat 240

```

ttcccactgg ctgaaagagc taacagagga tttggaatcg ttttcagcaa tggaaagaga 300
tggaaaggaga tccggcggtt ctccctcatg acgctgcgga attttgggat ggggaagagg 360
agcattgagg accgtgttca agaggaagcc cgctgccttg tggaggagtt gagaaaaacc 420
aaagcttcac cctgtgatcc cactttcatc ctgggctgtg ctccctgcaa tgtgatctgc 480
tccattatth tccagaaacg tttcgattat aaagatcagc aatttcttaa cttgatggaa 540
aaattgaatg aaaacatcag gattgtaagc accccctgga tccagatatg caataattht 600
cccactatca ttgattatth cccgggaacc cataacaaat tacttaaaaa ccttgcttht 660
atggaaagtg atatthtggg gaaagtaaaa gaacaccaag aatcgatgga catcaacaac 720
cctcgggact ttattgattg cttcctgatc aaaatggaga aggaaaagca aaaccaacag 780
tctgaattca ctattgaaaa cttggtaatc actgcagctg acttacttgg agctgggaca 840
gagacaacaa gcacaaccct gagatatgct ctccttctcc tgctgaagca cccagaggtc 900
acagctaaag tccaggaaga gattgaacgt gtcgttggca gaaaccggag cccctgcatg 960
caggacaggg gccacatgcc ctacacagat gctgtggtgc acgaggtcca gagatacatc 1020
gacctcatcc ccaccagcct gccccatgca gtgacctgtg acgttaaatt cagaaactac 1080
ctcattccca agggcacaac catattaact tccctcactt ctgtgctaca tgacaacaaa 1140
gaatttccca acccagagat gtttgacctt cgtcacttht tggatgaagg tggaaattht 1200
aagaaaagta actacttcat gcctthtctc gcaggaaaac ggatttgtgt gggagagggc 1260
ctggcccgca tggagctgtt tttattcctg accttcattt tacagaactt taacctgaaa 1320
tctctgattg acccaaagga cttgacaca actcctgttg tcaatggatt tgcttctgtc 1380
ccgcccttct accagctctg cttcattcct gtcaccacc accactga 1428

```

<210> 4

<211> 475

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Translation of
SEQ ID NO:3

<400> 4

```

Met Ala Lys Lys Thr Ser Ser Lys Gly Arg Pro Pro Gly Pro Thr Pro
  1                      5                      10                      15

Leu Pro Val Ile Gly Asn Ile Leu Gln Ile Asp Ile Lys Asp Val Ser
                20                      25                      30

Lys Ser Leu Thr Asn Leu Ser Lys Ile Tyr Gly Pro Val Phe Thr Leu
  35                      40                      45

Tyr Phe Gly Leu Glu Arg Met Val Val Leu His Gly Tyr Glu Val Val
  50                      55                      60

Lys Glu Ala Leu Ile Asp Leu Gly Glu Glu Phe Ser Gly Arg Gly His
  65                      70                      75                      80

Phe Pro Leu Ala Glu Arg Ala Asn Arg Gly Phe Gly Ile Val Phe Ser
                85                      90                      95

Asn Gly Lys Arg Trp Lys Glu Ile Arg Arg Phe Ser Leu Met Thr Leu
  100                      105                      110

Arg Asn Phe Gly Met Gly Lys Arg Ser Ile Glu Asp Arg Val Gln Glu
  115                      120                      125

Glu Ala Arg Cys Leu Val Glu Glu Leu Arg Lys Thr Lys Ala Ser Pro

```

130					135					140					
Cys 145	Asp	Pro	Thr	Phe	Ile 150	Leu	Gly	Cys	Ala	Pro 155	Cys	Asn	Val	Ile	Cys 160
Ser	Ile	Ile	Phe	Gln 165	Lys	Arg	Phe	Asp	Tyr 170	Lys	Asp	Gln	Gln	Phe	Leu 175
Asn	Leu	Met	Glu 180	Lys	Leu	Asn	Glu	Asn 185	Ile	Arg	Ile	Val	Ser	Thr	Pro 190
Trp	Ile	Gln 195	Ile	Cys	Asn	Asn	Phe 200	Pro	Thr	Ile	Ile	Asp	Tyr	Phe	Pro 205
Gly	Thr 210	His	Asn	Lys	Leu	Leu 215	Lys	Asn	Leu	Ala	Phe 220	Met	Glu	Ser	Asp
Ile 225	Leu	Glu	Lys	Val	Lys 230	Glu	His	Gln	Glu	Ser 235	Met	Asp	Ile	Asn	Asn 240
Pro	Arg	Asp	Phe	Ile 245	Asp	Cys	Phe	Leu	Ile 250	Lys	Met	Glu	Lys	Glu	Lys 255
Gln	Asn	Gln	Gln 260	Ser	Glu	Phe	Thr	Ile 265	Glu	Asn	Leu	Val	Ile	Thr	Ala 270
Ala	Asp	Leu 275	Leu	Gly	Ala	Gly	Thr 280	Glu	Thr	Thr	Ser	Thr	Thr	Leu	Arg 285
Tyr	Ala 290	Leu	Leu	Leu	Leu	Leu 295	Lys	His	Pro	Glu	Val 300	Thr	Ala	Lys	Val 305
Gln 305	Glu	Glu	Ile	Glu	Arg 310	Val	Val	Gly	Arg	Asn 315	Arg	Ser	Pro	Cys	Met 320
Gln	Asp	Arg	Gly	His 325	Met	Pro	Tyr	Thr	Asp 330	Ala	Val	Val	His	Glu	Val 335
Gln	Arg	Tyr	Ile 340	Asp	Leu	Ile	Pro	Thr 345	Ser	Leu	Pro	His	Ala	Val	Thr 350
Cys	Asp	Val 355	Lys	Phe	Arg	Asn	Tyr 360	Leu	Ile	Pro	Lys	Gly 365	Thr	Thr	Ile 370
Leu 370	Thr	Ser	Leu	Thr	Ser	Val 375	Leu	His	Asp	Asn	Lys 380	Glu	Phe	Pro	Asn 385
Pro	Glu	Met	Phe	Asp	Pro	Arg	His 390	Phe	Leu	Asp 395	Glu	Gly	Gly	Asn	Phe 400
Lys	Lys	Ser	Asn	Tyr 405	Phe	Met	Pro	Phe	Ser	Ala	Gly	Lys	Arg	Ile	Cys 410
Val	Gly	Glu	Gly 420	Leu	Ala	Arg	Met	Glu 425	Leu	Phe	Leu	Phe	Leu	Thr	Phe 430
Ile	Leu	Gln	Asn	Phe	Asn	Leu	Lys	Ser	Leu	Ile	Asp	Pro	Lys	Asp	Leu

435

440

445

Asp Thr Thr Pro Val Val Asn Gly Phe Ala Ser Val Pro Pro Phe Tyr
 450 455 460

Gln Leu Cys Phe Ile Pro Val His His His His
 465 470 475

<210> 5

<211> 1443

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: 2D6 encoding
 nucleic acid

<400> 5

```

atggctaataaa aaacctcttc taaaggccga cgcgcgggtc cgctgccgct gccaggcctg 60
ggtaacctgc tgcattgtga cttccagaac accccgtact gcttcgacca gctgcgtcgt 120
cgtttcgggtg acgtgttctc tctgcagctg gcttggaccc cggttgttgt tctgaacggg 180
ctggctgctg ttcgcgaagc tctggttacc cacggtgaag acaccgctga ccgtccgccg 240
gtcccgatca cccagatcct gggttttggt ccgcgttccc aagggtgttt cctggctcgt 300
tacggaccgg cttggcgtga acagcgtcgt ttctctgttt ctaccctgcg taacctgggt 360
ctgggtaaaa aatctctgga acagtgggtt accgaagaag ctgcatgcct gtgcgctgct 420
ttcgctaacc actctggctg tccgttccgt ccgaacggtc tgctggacaa agctgtttct 480
aacgttatcg cttctctgac ctgcggccgc cgtttcgaat acgacgacc gcgtttcctg 540
cgtctgctgg acctggctca ggaaggctct aaagaggagt ctggtttcct gcgtgaagtt 600
ctgaacgctg ttccggttct gctgcacatc ccagctctgg ctggtaaagt tctgcgtttc 660
cagaaagcat tcttgacca gctggacgaa ctgctgaccg aacaccgtat gacctgggac 720
ccggctcagc cgccacgtga cctgaccgaa gctttcctgg ctgaaatgga aaaagctaaa 780
ggtaaccggg aatcttcttt caacgatgaa aatctgcgta tcgttgttgc tgacctgttc 840
tccgcgggta tggttaccac ctctaccacc ctggcttggg gtctgctgct gatgatcctg 900
caccgggatg tacagcgtcg tgttcagcag gaaatcgacg acgttattgg ccaggttcgt 960
cggccggaaa tgggtgacca ggctcacatg ccgtacacca ccgtgttat ccacgaagt 1020
cagcgcttcg gtgacatcgt tccgctgggt atgaccaca tgacctctcg tgacatcgaa 1080
gttcagggtt tccgtatccc gaaagggtacc accctgatca ccaacctgtc ttctgttctg 1140
aaagacgaag ctgtttggga aaaaccgttc cgtttccatc cggaacactt cctggacgct 1200
cagggtcact tcgttaaacc ggaagcttcc ctgcggttct ctgctggctg tcgtgcttgc 1260
ctgggtgaac cgctggctcg tatggaactg ttctgttctc tcacctctct gctgcagcac 1320
ttctctttct ctgttccgac cggtcagccg cgtccgtctc accacggtgt ttctgctttc 1380
ctggtttctc cgtctccgta cgaactgtgc gctgttccgc gtggagctca ccaccaccac 1440
tga 1443

```

<210> 6

<211> 480

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Translation of
 SEQ ID NO: 5

<400> 6

Met Ala Lys Lys Thr Ser Ser Lys Gly Arg Pro Pro Gly Pro Leu Pro

1	5	10	15
Leu Pro Gly Leu Gly Asn Leu Leu His Val Asp Phe Gln Asn Thr Pro	20	25	30
Tyr Cys Phe Asp Gln Leu Arg Arg Arg Phe Gly Asp Val Phe Ser Leu	35	40	45
Gln Leu Ala Trp Thr Pro Val Val Val Leu Asn Gly Leu Ala Ala Val	50	55	60
Arg Glu Ala Leu Val Thr His Gly Glu Asp Thr Ala Asp Arg Pro Pro	65	70	75
Val Pro Ile Thr Gln Ile Leu Gly Phe Gly Pro Arg Ser Gln Gly Val	85	90	95
Phe Leu Ala Arg Tyr Gly Pro Ala Trp Arg Glu Gln Arg Arg Phe Ser	100	105	110
Val Ser Thr Leu Arg Asn Leu Gly Leu Gly Lys Lys Ser Leu Glu Gln	115	120	125
Trp Val Thr Glu Glu Ala Ala Cys Leu Cys Ala Ala Phe Ala Asn His	130	135	140
Ser Gly Arg Pro Phe Arg Pro Asn Gly Leu Leu Asp Lys Ala Val Ser	145	150	155
Asn Val Ile Ala Ser Leu Thr Cys Gly Arg Arg Phe Glu Tyr Asp Asp	165	170	175
Pro Arg Phe Leu Arg Leu Leu Asp Leu Ala Gln Glu Gly Leu Lys Glu	180	185	190
Glu Ser Gly Phe Leu Arg Glu Val Leu Asn Ala Val Pro Val Leu Leu	195	200	205
His Ile Pro Ala Leu Ala Gly Lys Val Leu Arg Phe Gln Lys Ala Phe	210	215	220
Leu Thr Gln Leu Asp Glu Leu Leu Thr Glu His Arg Met Thr Trp Asp	225	230	235
Pro Ala Gln Pro Pro Arg Asp Leu Thr Glu Ala Phe Leu Ala Glu Met	245	250	255
Glu Lys Ala Lys Gly Asn Pro Glu Ser Ser Phe Asn Asp Glu Asn Leu	260	265	270
Arg Ile Val Val Ala Asp Leu Phe Ser Ala Gly Met Val Thr Thr Ser	275	280	285
Thr Thr Leu Ala Trp Gly Leu Leu Leu Met Ile Leu His Pro Asp Val	290	295	300
Gln Arg Arg Val Gln Gln Glu Ile Asp Asp Val Ile Gly Gln Val Arg			

305		310		315		320									
Arg	Pro	Glu	Met	Gly	Asp	Gln	Ala	His	Met	Pro	Tyr	Thr	Thr	Ala	Val
				325					330					335	
Ile	His	Glu	Val	Gln	Arg	Phe	Gly	Asp	Ile	Val	Pro	Leu	Gly	Met	Thr
			340					345					350		
His	Met	Thr	Ser	Arg	Asp	Ile	Glu	Val	Gln	Gly	Phe	Arg	Ile	Pro	Lys
		355					360					365			
Gly	Thr	Thr	Leu	Ile	Thr	Asn	Leu	Ser	Ser	Val	Leu	Lys	Asp	Glu	Ala
	370					375					380				
Val	Trp	Glu	Lys	Pro	Phe	Arg	Phe	His	Pro	Glu	His	Phe	Leu	Asp	Ala
385					390					395					400
Gln	Gly	His	Phe	Val	Lys	Pro	Glu	Ala	Phe	Leu	Pro	Phe	Ser	Ala	Gly
				405					410					415	
Arg	Arg	Ala	Cys	Leu	Gly	Glu	Pro	Leu	Ala	Arg	Met	Glu	Leu	Phe	Leu
			420					425					430		
Phe	Phe	Thr	Ser	Leu	Leu	Gln	His	Phe	Ser	Phe	Ser	Val	Pro	Thr	Gly
		435				440						445			
Gln	Pro	Arg	Pro	Ser	His	His	Gly	Val	Phe	Ala	Phe	Leu	Val	Ser	Pro
	450					455					460				
Ser	Pro	Tyr	Glu	Leu	Cys	Ala	Val	Pro	Arg	Gly	Ala	His	His	His	His
465					470					475					480

<210> 7

<211> 1458

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: 3A4

<400> 7

```

atggcatacg gtactcattc acatgggtctg tttaaaaaac tgggaattcc agggcccaca 60
cctctgcctt ttttgggaaa tattttgtcc taccataagg gcttttgtat gtttgacatg 120
gaatgtcata aaaagtatgg aaaagtgtgg ggcttttatg atgggtcaaca gcctgtgctg 180
gctatcacag atcctgacat gatcaaaaca gtgctagtga aagaatgtta ttctgtcttc 240
acaaaccgga ggccttttgg tccagtggga tttatgaaaa gtgccatctc tatagctgag 300
gatgaagaat ggaagagatt acgatcattg ctgtctccaa ccttcaccag tggaaaactc 360
aaggagatgg tccctatcat tgcccagtat ggagatgtgt tggtgagaaa tctgaggcgg 420
gaagcagaga caggcaagcc tgtcaccttg aaagacgtct ttggggccta cagcatggat 480
gtgatcacta gcacatcatt tggagtgaac atcgactctc tcaacaatcc acaagacccc 540
tttgtggaaa acaccaagaa gcttttaaga tttgattttt tggatccatt ctttctctca 600
ataacagtct ttccattcct catcccaatt cttgaagtat taaatatctg tgtgtttcca 660
agagaagtta caaatttttt aagaaaatct gtaaaaagga tgaaagaaag tcgcctcgaa 720

```



```

gatacacaaa agcaccgagt ggatttcctt cagctgatga ttgactctca gaattcaaaa 780
gaaactgagt cccacaaagc tctgtccgat ctggagctcg tggcccaatc aattatcttt 840
atTTTTgctg gctatgaaac cacgagcagt gttctctcct tcattatgta tgaactggcc 900
actcaccctg atgtccagca gaaactgcag gaggaaattg atgcagtttt acccaataag 960
gcaccacca cctatgatac tgtgctacag atggagtatc ttgacatggg ggtgaatgaa 1020
acgctcagat tattcccaat tgctatgaga cttgagaggg tctgcaaaaa agatgttgag 1080
atcaatggga tgttcattcc caaaggggtg gtggtgatga ttccaagcta tgctcttcac 1140
cgtgacccaa agtactggac agagcctgag aagttcctcc ctgaaagatt cagcaagaag 1200
aacaaggaca acatagatcc ttacatatac acaccctttg gaagtggacc cagaaactgc 1260
attggcatga ggtttgctct catgaacatg aaacttgctc taatcagagt ccttcagaac 1320
ttctccttca aaccttgtaa agaaacacag atccccctga aattaagctt aggaggactt 1380
cttcaaccag aaaaaccctg tgttctaaag gttgagtcaa gggatggcac cgtaagtgga 1440
gccaccatc accattga 1458

```

<210> 8

<211> 485

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: 3A4

<400> 8

```

Met Ala Tyr Gly Thr His Ser His Gly Leu Phe Lys Lys Leu Gly Ile
  1             5             10             15

```

```

Pro Gly Pro Thr Pro Leu Pro Phe Leu Gly Asn Ile Leu Ser Tyr His
      20             25             30

```

```

Lys Gly Phe Cys Met Phe Asp Met Glu Cys His Lys Lys Tyr Gly Lys
      35             40             45

```

```

Val Trp Gly Phe Tyr Asp Gly Gln Gln Pro Val Leu Ala Ile Thr Asp
      50             55             60

```

```

Pro Asp Met Ile Lys Thr Val Leu Val Lys Glu Cys Tyr Ser Val Phe
      65             70             75             80

```

```

Thr Asn Arg Arg Pro Phe Gly Pro Val Gly Phe Met Lys Ser Ala Ile
      85             90             95

```

```

Ser Ile Ala Glu Asp Glu Glu Trp Lys Arg Leu Arg Ser Leu Leu Ser
      100            105            110

```

```

Pro Thr Phe Thr Ser Gly Lys Leu Lys Glu Met Val Pro Ile Ile Ala
      115            120            125

```

```

Gln Tyr Gly Asp Val Leu Val Arg Asn Leu Arg Arg Glu Ala Glu Thr
      130            135            140

```

```

Gly Lys Pro Val Thr Leu Lys Asp Val Phe Gly Ala Tyr Ser Met Asp
      145            150            155            160

```

```

Val Ile Thr Ser Thr Ser Phe Gly Val Asn Ile Asp Ser Leu Asn Asn
      165            170            175

```

Pro	Gln	Asp	Pro	Phe	Val	Glu	Asn	Thr	Lys	Lys	Leu	Leu	Arg	Phe	Asp	
			180					185					190			
Phe	Leu	Asp	Pro	Phe	Phe	Leu	Ser	Ile	Thr	Val	Phe	Pro	Phe	Leu	Ile	
		195					200					205				
Pro	Ile	Leu	Glu	Val	Leu	Asn	Ile	Cys	Val	Phe	Pro	Arg	Glu	Val	Thr	
	210					215					220					
Asn	Phe	Leu	Arg	Lys	Ser	Val	Lys	Arg	Met	Lys	Glu	Ser	Arg	Leu	Glu	
225					230					235					240	
Asp	Thr	Gln	Lys	His	Arg	Val	Asp	Phe	Leu	Gln	Leu	Met	Ile	Asp	Ser	
				245					250					255		
Gln	Asn	Ser	Lys	Glu	Thr	Glu	Ser	His	Lys	Ala	Leu	Ser	Asp	Leu	Glu	
			260					265					270			
Leu	Val	Ala	Gln	Ser	Ile	Ile	Phe	Ile	Phe	Ala	Gly	Tyr	Glu	Thr	Thr	
		275					280					285				
Ser	Ser	Val	Leu	Ser	Phe	Ile	Met	Tyr	Glu	Leu	Ala	Thr	His	Pro	Asp	
	290					295					300					
Val	Gln	Gln	Lys	Leu	Gln	Glu	Glu	Ile	Asp	Ala	Val	Leu	Pro	Asn	Lys	
305					310					315					320	
Ala	Pro	Pro	Thr	Tyr	Asp	Thr	Val	Leu	Gln	Met	Glu	Tyr	Leu	Asp	Met	
				325					330					335		
Val	Val	Asn	Glu	Thr	Leu	Arg	Leu	Phe	Pro	Ile	Ala	Met	Arg	Leu	Glu	
			340					345					350			
Arg	Val	Cys	Lys	Lys	Asp	Val	Glu	Ile	Asn	Gly	Met	Phe	Ile	Pro	Lys	
		355					360					365				
Gly	Val	Val	Val	Met	Ile	Pro	Ser	Tyr	Ala	Leu	His	Arg	Asp	Pro	Lys	
	370					375					380					
Tyr	Trp	Thr	Glu	Pro	Glu	Lys	Phe	Leu	Pro	Glu	Arg	Phe	Ser	Lys	Lys	
385					390					395					400	
Asn	Lys	Asp	Asn	Ile	Asp	Pro	Tyr	Ile	Tyr	Thr	Pro	Phe	Gly	Ser	Gly	
				405					410					415		
Pro	Arg	Asn	Cys	Ile	Gly	Met	Arg	Phe	Ala	Leu	Met	Asn	Met	Lys	Leu	
			420			\		425					430			
Ala	Leu	Ile	Arg	Val	Leu	Gln	Asn	Phe	Ser	Phe	Lys	Pro	Cys	Lys	Glu	
		435					440					445				
Thr	Gln	Ile	Pro	Leu	Lys	Leu	Ser	Leu	Gly	Gly	Leu	Leu	Gln	Pro	Glu	
	450					455					460					
Lys	Pro	Val	Val	Leu	Lys	Val	Glu	Ser	Arg	Asp	Gly	Thr	Val	Ser	Gly	
465					470					475					480	

Ala His His His His
485

<210> 9
<211> 9
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Motif

<400> 9
Ala Lys Lys Thr Ser Ser Lys Gly Arg
1 5

<210> 10
<211> 10
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Leader
sequence

<400> 10
Met Ala Lys Lys Thr Ser Ser Lys Gly Arg
1 5 10

<210> 11
<211> 13
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: N-terminal
sequence of 3A4

<400> 11
Met Ala Tyr Gly Thr His Ser His Gly Leu Phe Lys Lys
1 5 10

<210> 12
<211> 30
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence:
Oligonucleotide

<400> 12
caagaggaag cccgctgcct tgtggaggag

<210> 13
<211> 30
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence:
Oligonucleotide

<400> 13
ctcctccaca aggcagcggg cttcctcttg

30

<210> 14
<211> 37
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence:
Oligonucleotide

<400> 14
ccctcgtcac tttctggatg aaggtggaaa ttttaag

37

<210> 15
<211> 37
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence:
Oligonucleotide

<400> 15
cttaaaattt ccaccttcac ccagaaagtg acgaggg

37

<210> 16
<211> 50
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Oligo used for
the 2D6 assembly

<400> 16
catatggcta aaaaaacctc ttctaaaggc cgaccgccgg gtccgctgcc

50

<210> 17
<211> 50
<212> DNA
<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Oligo used for
the 2D6 assembly

<400> 17

gctgccaggc ctgggtaacc tgctgcatgt ggacttccag aacaccccgt 50

<210> 18

<211> 50

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Oligo used for
the 2D6 assembly

<400> 18

actgcttcga ccagctgcgt cgtcgtttcg gtgacgtgtt ctctctgcag 50

<210> 19

<211> 50

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Oligo used for
the 2D6 assembly

<400> 19

ctggcttgga ccccggttgt tgttctgaac ggtctggctg ctgttcgcga 50

<210> 20

<211> 50

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Oligo used for
the 2D6 assembly

<400> 20

agctctgggtt acccacggtg aagacaccgc tgaccgtccg ccggtcccga 50

<210> 21

<211> 50

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Oligo used for
the 2D6 assembly

<400> 21
tcaccagat cctgggtttt ggtccgcgtt cccaaggtgt tttcctggct 50

<210> 22
<211> 50
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Oligo used for
the 2D6 assembly

<400> 22
cgttacggac cggcttggcg tgaacagcgt cgtttctctg tttctaccct 50

<210> 23
<211> 50
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Oligo used for
the 2D6 assembly

<400> 23
gcgtaacctg ggtctgggta aaaaatctct ggaacagtgg gttaccgaag 50

<210> 24
<211> 50
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Oligo used for
the 2D6 assembly

<400> 24
aagctgcatg cctgtgctg gctttcgcta accactctgg tcgtccgttc 50

<210> 25
<211> 50
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Oligo used for
the 2D6 assembly

<400> 25
cgtccgaacg gtctgctgga caaagctgtt tctaacgtta tcgcttctct 50

<210> 26

<211> 50
 <212> DNA
 <213> Artificial Sequence

 <220>
 <223> Description of Artificial Sequence: Oligo used for
 the 2D6 assembly

 <400> 26
 gacctgcggc cgccgtttcg aatacgacga cccgcgtttc ctgcgtctgc 50

 <210> 27
 <211> 50
 <212> DNA
 <213> Artificial Sequence

 <220>
 <223> Description of Artificial Sequence: Oligo used for
 the 2D6 assembly

 <400> 27
 tggacctggc tcaggaaggt ctgaaagagg agtctggttt cctgcgtgaa 50

 <210> 28
 <211> 50
 <212> DNA
 <213> Artificial Sequence

 <220>
 <223> Description of Artificial Sequence: Oligo used for
 the 2D6 assembly

 <400> 28
 gttctgaacg ctgttccggt tctgctgcac atcccagctc tggctggtaa 50

 <210> 29
 <211> 50
 <212> DNA
 <213> Artificial Sequence

 <220>
 <223> Description of Artificial Sequence: Oligo used for
 the 2D6 assembly

 <400> 29
 agttctgcgt ttccagaaag cattcctgac ccagctggac gaactgctga 50

 <210> 30
 <211> 50
 <212> DNA
 <213> Artificial Sequence

 <220>

<223> Description of Artificial Sequence: Oligo used for
the 2D6 assembly

<400> 30

ccgaacaccg tatgacctgg gacccggctc agccgccacg tgacctgacc

50

<210> 31

<211> 50

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Oligo used for
the 2D6 assembly

<400> 31

gaagcttttc tggctgaaat ggaaaaagct aaaggtaacc cggaatcttc

50

<210> 32

<211> 50

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Oligo used for
the 2D6 assembly

<400> 32

tttcaacgat gaaaatctgc gtatcggtgt tgctgacctg ttctccgcgg

50

<210> 33

<211> 50

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Oligo used for
the 2D6 assembly

<400> 33

gtatggttac cacctctacc accctggctt ggggtctgct gctgatgac

50

<210> 34

<211> 50

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Oligo used for
the 2D6 assembly

<400> 34

ctgcaccgg atgtacagcg tcgtgttcag caggaaatcg acgacgttat

50

<210> 35
<211> 50
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Oligo used for
the 2D6 assembly

<400> 35
tggccagggtt cgtcggccgg aaatgggtga ccagggtcac atgccgtaca 50

<210> 36
<211> 50
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Oligo used for
the 2D6 assembly

<400> 36
ccaccgctgt tatccacgaa gttcagcgct tcggtgacat cgttccgctg 50

<210> 37
<211> 50
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Oligo used for
the 2D6 assembly

<400> 37
ggtatgaccc acatgacctc tcgtgacatc gaagttcagg gtttccgtat 50

<210> 38
<211> 50
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Oligo used for
the 2D6 assembly

<400> 38
cccgaagggt accaccctga tcaccaacct gtcttctgtt ctgaaagacg 50

<210> 39
<211> 50
<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Oligo used for the 2D6 assembly

<400> 39

aagctgtttg ggaaaaaccg ttccgtttcc atccggaaca cttcctggac 50

<210> 40

<211> 50

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Oligo used for the 2D6 assembly

<400> 40

gctcagggtc acttcgttaa accggaagct ttctgcccgt tctctgctgg 50

<210> 41

<211> 50

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Oligo used for the 2D6 assembly

<400> 41

tcgtcgtgct tgcttggtg aaccgctggc tcgtatggaa ctgttcctgt 50

<210> 42

<211> 50

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Oligo used for the 2D6 assembly

<400> 42

tcttcacctc tctgctgcag cacttctctt tctctgttcc gaccggtcag 50

<210> 43

<211> 50

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Oligo used for the 2D6 assembly

<400> 43
ccgcgtccgt ctcaccacgg tgttttcgct ttcttggttt ctccgtctcc 50

<210> 44
<211> 77
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Oligo used for
the 2D6 assembly

<400> 44
gtcgactcag tgggtggtggt gagctccacg cggaacacg cagagttcgt acggagacgg 60
agaaaccagg aaagcga 77

<210> 45
<211> 50
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Oligo used for
the 2D6 assembly

<400> 45
aaacaccgtg gtgagacgga cgcggtgac cggtcggaac agagaaagag 50

<210> 46
<211> 50
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Oligo used for
the 2D6 assembly

<400> 46
aagtgtgca gcagagaggt gaagaacagg aacagttcca tacgagccag 50

<210> 47
<211> 50
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Oligo used for
the 2D6 assembly

<400> 47
cggttcacc aggcaagcac gacgaccagc agagaacggc aggaaagctt 50

<210> 48
<211> 50
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Oligo used for
the 2D6 assembly

<400> 48
ccggtttaac gaagtgaccc tgagcgtcca ggaagtgttc cggatggaaa 50

<210> 49
<211> 50
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Oligo used for
the 2D6 assembly

<400> 49
cggaacgggtt tttcccaaac agcttcgtct ttcagaacag aagacaggtt 50

<210> 50
<211> 50
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Oligo used for
the 2D6 assembly

<400> 50
ggtgatcagg gtgttacctt tcgggatacg gaaaccctga acttcgatgt 50

<210> 51
<211> 50
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Oligo used for
the 2D6 assembly

<400> 51
cacgagaggt catgtgggtc ataccagcg gaacgatgtc accgaagcgc 50

<210> 52
<211> 50
<212> DNA
<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Oligo used for
the 2D6 assembly

<400> 52

tgaacttcgt ggataacagc ggtggtgtac ggcatgtgag cctggtcacc

50

<210> 53

<211> 50

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Oligo used for
the 2D6 assembly

<400> 53

catttcgpgc cgacgaacct ggccaataac gtcgtcgatt tcctgctgaa

50

<210> 54

<211> 50

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Oligo used for
the 2D6 assembly

<400> 54

cacgacgctg tacatccggg tgcaggatca tcagcagcag accccaagcc

50

<210> 55

<211> 50

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Oligo used for
the 2D6 assembly

<400> 55

agggtggtag aggtggtaac catacccgcg gagaacaggt cagcaacaac

50

<210> 56

<211> 50

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Oligo used for
the 2D6 assembly

<400> 56
gatacgcaga ttttcatcgt tgaaagaaga ttccgggtta ctttagctt 50

<210> 57
<211> 50
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Oligo used for
the 2D6 assembly

<400> 57
tttccatttc agccaggaaa gcttcggtca ggtcacgtgg cggctgagcc 50

<210> 58
<211> 50
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Oligo used for
the 2D6 assembly

<400> 58
gggtcccagg tcatacgggtg ttcggtcagc agttcgtcca gctgggtcag 50

<210> 59
<211> 50
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Oligo used for
the 2D6 assembly

<400> 59
gaatgctttc tggaaacgca gaactttacc agccagagct gggatgtgca 50

<210> 60
<211> 50
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Oligo used for
the 2D6 assembly

<400> 60
gcagaaccgg aacagcggtc agaacttcac gcaggaaacc agactcctct 50

<210> 61

<211> 50
 <212> DNA
 <213> Artificial Sequence

 <220>
 <223> Description of Artificial Sequence: Oligo used for
 the 2D6 assembly

 <400> 61
 ttcagacctt cctgagccag gtccagcaga cgcaggaaac gcgggtcgtc 50

 <210> 62
 <211> 50
 <212> DNA
 <213> Artificial Sequence

 <220>
 <223> Description of Artificial Sequence: Oligo used for
 the 2D6 assembly

 <400> 62
 gtattcgaaa cggcggccgc aggtcagaga agcgataacg ttagaaacag 50

 <210> 63
 <211> 50
 <212> DNA
 <213> Artificial Sequence

 <220>
 <223> Description of Artificial Sequence: Oligo used for
 the 2D6 assembly

 <400> 63
 ctttgtccag cagaccgttc ggacggaacg gacgaccaga gtggtagcg 50

 <210> 64
 <211> 50
 <212> DNA
 <213> Artificial Sequence

 <220>
 <223> Description of Artificial Sequence: Oligo used for
 the 2D6 assembly

 <400> 64
 aaagcagcgc acaggcatgc agcttcttcg gtaaccact gttccagaga 50

 <210> 65
 <211> 50
 <212> DNA
 <213> Artificial Sequence

 <220>

<223> Description of Artificial Sequence: Oligo used for
the 2D6 assembly

<400> 65

ttttttaccc agaccaggt tacgcagggt agaaacagag aaacgacgct 50

<210> 66

<211> 50

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Oligo used for
the 2D6 assembly

<400> 66

gttcagcca agccggtccg taacgagcca ggaaaacacc ttgggaacgc 50

<210> 67

<211> 50

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Oligo used for
the 2D6 assembly

<400> 67

ggacaaaac ccaggatctg ggtgatcggg accggcggac ggtcagcggc 50

<210> 68

<211> 50

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Oligo used for
the 2D6 assembly

<400> 68

gtcttcaccg tgggtaacca gagcttcgag aacagcagcc agaccgttca 50

<210> 69

<211> 50

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Oligo used for
the 2D6 assembly

<400> 69

gaacaacaac cggggtccaa gccagctgca gagagaacac gtcaccgaaa 50

<210> 70
<211> 50
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Oligo used for
the 2D6 assembly

<400> 70
cgacgacgca gctggtcgaa gcagtacggg gtgttctgga agtccacatg 50

<210> 71
<211> 50
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Oligo used for
the 2D6 assembly

<400> 71
cagcaggtta cccaggcctg gcagcggcag cggacccggc ggtcggcctt 50

<210> 72
<211> 29
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Primer

<400> 72
gtaacctggg tctgggtaaa aaatctctg 29

<210> 73
<211> 29
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Primer

<400> 73
cagagatttt ttaccagac ccaggttac 29

<210> 74
<211> 33
<212> DNA
<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Primer

<400> 74

ggaattcata tggctctcat cccagacttg gcc

33

<210> 75

<211> 47

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Primer

<400> 75

tgcggtcgac tcaatgggtga tgggtgggctc cacttacggt gccatcc

47

<210> 76

<211> 69

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Primer

<400> 76

ttaacatatg gcatatggta ctcatcaca tggctctgttt aaaaaactgg gaattccagg 60
gccacacc 69

<210> 77

<211> 475

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: 2C9-FGloop

<400> 77

Met	Ala	Lys	Lys	Thr	Ser	Ser	Lys	Gly	Arg	Pro	Pro	Gly	Pro	Thr	Pro	
1				5				10					15			
Leu	Pro	Val	Ile	Gly	Asn	Ile	Leu	Gln	Ile	Gly	Ile	Lys	Asp	Ile	Ser	
			20					25					30			
Lys	Ser	Leu	Thr	Asn	Leu	Ser	Lys	Val	Tyr	Gly	Pro	Val	Phe	Thr	Leu	
			35					40					45			
Tyr	Phe	Gly	Leu	Lys	Pro	Ile	Val	Val	Leu	His	Gly	Tyr	Glu	Ala	Val	
			50				55				60					
Lys	Glu	Ala	Leu	Ile	Asp	Leu	Gly	Glu	Glu	Phe	Ser	Gly	Arg	Gly	Ile	
			65			70				75					80	
Phe	Pro	Leu	Ala	Glu	Arg	Ala	Asn	Arg	Gly	Phe	Gly	Ile	Val	Phe	Ser	

85					90					95					
Asn	Gly	Lys	Lys	Trp	Lys	Glu	Ile	Arg	Arg	Phe	Ser	Leu	Met	Thr	Leu
			100					105					110		
Arg	Asn	Phe	Gly	Met	Gly	Lys	Arg	Ser	Ile	Glu	Asp	Arg	Val	Gln	Glu
		115					120					125			
Glu	Ala	Arg	Cys	Leu	Val	Glu	Glu	Leu	Arg	Lys	Thr	Lys	Ala	Ser	Pro
	130					135					140				
Cys	Asp	Pro	Thr	Phe	Ile	Leu	Gly	Cys	Ala	Pro	Cys	Asn	Val	Ile	Cys
145						150					155				160
Ser	Ile	Ile	Phe	His	Lys	Arg	Phe	Asp	Tyr	Lys	Asp	Gln	Gln	Phe	Leu
				165					170					175	
Asn	Leu	Met	Glu	Lys	Leu	Asn	Glu	Asn	Ile	Lys	Ile	Leu	Ser	Ser	Pro
			180					185					190		
Trp	Ile	Gln	Val	Tyr	Asn	Asn	Phe	Pro	Ala	Leu	Leu	Asp	Tyr	Phe	Pro
		195					200					205			
Gly	Thr	His	Asn	Lys	Leu	Leu	Lys	Asn	Val	Ala	Phe	Met	Lys	Ser	Tyr
	210					215					220				
Ile	Leu	Glu	Lys	Val	Lys	Glu	His	Gln	Glu	Ser	Met	Asp	Met	Asn	Asn
225						230					235				240
Pro	Gln	Asp	Phe	Ile	Asp	Cys	Phe	Leu	Met	Lys	Met	Glu	Lys	Glu	Lys
			245						250					255	
His	Asn	Gln	Pro	Ser	Glu	Phe	Thr	Ile	Glu	Ser	Leu	Glu	Asn	Thr	Ala
			260					265					270		
Val	Asp	Leu	Phe	Gly	Ala	Gly	Thr	Glu	Thr	Thr	Ser	Thr	Thr	Leu	Arg
		275					280					285			
Tyr	Ala	Leu	Leu	Leu	Leu	Leu	Lys	His	Pro	Glu	Val	Thr	Ala	Lys	Val
	290					295					300				
Gln	Glu	Glu	Ile	Glu	Arg	Val	Ile	Gly	Arg	Asn	Arg	Ser	Pro	Cys	Met
305						310					315				320
Gln	Asp	Arg	Ser	His	Met	Pro	Tyr	Thr	Asp	Ala	Val	Val	His	Glu	Val
				325					330					335	
Gln	Arg	Tyr	Ile	Asp	Leu	Leu	Pro	Thr	Ser	Leu	Pro	His	Ala	Val	Thr
			340					345					350		
Cys	Asp	Ile	Lys	Phe	Arg	Asn	Tyr	Leu	Ile	Pro	Lys	Gly	Thr	Thr	Ile
		355					360					365			
Leu	Ile	Ser	Leu	Thr	Ser	Val	Leu	His	Asp	Asn	Lys	Glu	Phe	Pro	Asn
	370					375					380				
Pro	Glu	Met	Phe	Asp	Pro	His	His	Phe	Leu	Asp	Glu	Gly	Gly	Asn	Phe

Ser	Ile	Ile	Phe	His	Lys	Arg	Phe	Asp	Tyr	Lys	Asp	Gln	Gln	Phe	Leu	165	170	175
Asn	Leu	Met	Glu	Lys	Leu	Asn	Glu	Asn	Ile	Lys	Ile	Leu	Ser	Ser	Pro	180	185	190
Trp	Ile	Gln	Ile	Cys	Asn	Asn	Phe	Pro	Thr	Ile	Ile	Asp	Tyr	Phe	Pro	195	200	205
Gly	Thr	His	Asn	Lys	Leu	Leu	Lys	Asn	Val	Ala	Phe	Met	Lys	Ser	Tyr	210	215	220
Ile	Leu	Glu	Lys	Val	Lys	Glu	His	Gln	Glu	Ser	Met	Asp	Met	Asn	Asn	225	230	235
Pro	Gln	Asp	Phe	Ile	Asp	Cys	Phe	Leu	Met	Lys	Met	Glu	Lys	Glu	Lys	245	250	255
His	Asn	Gln	Pro	Ser	Glu	Phe	Thr	Ile	Glu	Ser	Leu	Glu	Asn	Thr	Ala	260	265	270
Val	Asp	Leu	Phe	Gly	Ala	Gly	Thr	Glu	Thr	Thr	Ser	Thr	Thr	Leu	Arg	275	280	285
Tyr	Ala	Leu	Leu	Leu	Leu	Leu	Lys	His	Pro	Glu	Val	Thr	Ala	Lys	Val	290	295	300
Gln	Glu	Glu	Ile	Glu	Arg	Val	Ile	Gly	Arg	Asn	Arg	Ser	Pro	Cys	Met	305	310	315
Gln	Asp	Arg	Ser	His	Met	Pro	Tyr	Thr	Asp	Ala	Val	Val	His	Glu	Val	325	330	335
Gln	Arg	Tyr	Ile	Asp	Leu	Leu	Pro	Thr	Ser	Leu	Pro	His	Ala	Val	Thr	340	345	350
Cys	Asp	Ile	Lys	Phe	Arg	Asn	Tyr	Leu	Ile	Pro	Lys	Gly	Thr	Thr	Ile	355	360	365
Leu	Ile	Ser	Leu	Thr	Ser	Val	Leu	His	Asp	Asn	Lys	Glu	Phe	Pro	Asn	370	375	380
Pro	Glu	Met	Phe	Asp	Pro	His	His	Phe	Leu	Asp	Glu	Gly	Gly	Asn	Phe	385	390	395
Lys	Lys	Ser	Lys	Tyr	Phe	Met	Pro	Phe	Ser	Ala	Gly	Lys	Arg	Ile	Cys	405	410	415
Val	Gly	Glu	Ala	Leu	Ala	Gly	Met	Glu	Leu	Phe	Leu	Phe	Leu	Thr	Ser	420	425	430
Ile	Leu	Gln	Asn	Phe	Asn	Leu	Lys	Ser	Leu	Val	Asp	Pro	Lys	Asn	Leu	435	440	445
Asp	Thr	Thr	Pro	Val	Val	Asn	Gly	Phe	Ala	Ser	Val	Pro	Pro	Phe	Tyr	450	455	460

Gln Leu Cys Phe Ile Pro Val His His His His
465 470 475

<210> 79

<211> 475

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: 2C9-P220

<400> 79

Met Ala Lys Lys Thr Ser Ser Lys Gly Arg Pro Pro Gly Pro Thr Pro
1 5 10 15

Leu Pro Val Ile Gly Asn Ile Leu Gln Ile Gly Ile Lys Asp Ile Ser
20 25 30

Lys Ser Leu Thr Asn Leu Ser Lys Val Tyr Gly Pro Val Phe Thr Leu
35 40 45

Tyr Phe Gly Leu Lys Pro Ile Val Val Leu His Gly Tyr Glu Ala Val
50 55 60

Lys Glu Ala Leu Ile Asp Leu Gly Glu Glu Phe Ser Gly Arg Gly Ile
65 70 75 80

Phe Pro Leu Ala Glu Arg Ala Asn Arg Gly Phe Gly Ile Val Phe Ser
85 90 95

Asn Gly Lys Lys Trp Lys Glu Ile Arg Arg Phe Ser Leu Met Thr Leu
100 105 110

Arg Asn Phe Gly Met Gly Lys Arg Ser Ile Glu Asp Arg Val Gln Glu
115 120 125

Glu Ala Arg Cys Leu Val Glu Glu Leu Arg Lys Thr Lys Ala Ser Pro
130 135 140

Cys Asp Pro Thr Phe Ile Leu Gly Cys Ala Pro Cys Asn Val Ile Cys
145 150 155 160

Ser Ile Ile Phe His Lys Arg Phe Asp Tyr Lys Asp Gln Gln Phe Leu
165 170 175

Asn Leu Met Glu Lys Leu Asn Glu Asn Ile Lys Ile Leu Ser Ser Pro
180 185 190

Trp Ile Gln Ile Cys Asn Asn Phe Pro Thr Ile Ile Asp Tyr Phe Pro
195 200 205

Gly Thr His Asn Lys Leu Leu Lys Asn Val Ala Phe Met Lys Ser Tyr
210 215 220

Ile Leu Glu Lys Val Lys Glu His Gln Glu Ser Met Asp Met Asn Asn
225 230 235 240

Pro	Gln	Asp	Phe	Ile	Asp	Cys	Phe	Leu	Met	Lys	Met	Glu	Lys	Glu	Lys	245	250	255
His	Asn	Gln	Pro	Ser	Glu	Phe	Thr	Ile	Glu	Ser	Leu	Glu	Asn	Thr	Ala	260	265	270
Val	Asp	Leu	Phe	Gly	Ala	Gly	Thr	Glu	Thr	Thr	Ser	Thr	Thr	Leu	Arg	275	280	285
Tyr	Ala	Leu	Leu	Leu	Leu	Leu	Lys	His	Pro	Glu	Val	Thr	Ala	Lys	Val	290	295	300
Gln	Glu	Glu	Ile	Glu	Arg	Val	Ile	Gly	Arg	Asn	Arg	Ser	Pro	Cys	Met	305	310	315
Gln	Asp	Arg	Ser	His	Met	Pro	Tyr	Thr	Asp	Ala	Val	Val	His	Glu	Val	325	330	335
Gln	Arg	Tyr	Ile	Asp	Leu	Leu	Pro	Thr	Ser	Leu	Pro	His	Ala	Val	Thr	340	345	350
Cys	Asp	Ile	Lys	Phe	Arg	Asn	Tyr	Leu	Ile	Pro	Lys	Gly	Thr	Thr	Ile	355	360	365
Leu	Ile	Ser	Leu	Thr	Ser	Val	Leu	His	Asp	Asn	Lys	Glu	Phe	Pro	Asn	370	375	380
Pro	Glu	Met	Phe	Asp	Pro	His	His	Phe	Leu	Asp	Glu	Gly	Gly	Asn	Phe	385	390	395
Lys	Lys	Ser	Lys	Tyr	Phe	Met	Pro	Phe	Ser	Ala	Gly	Lys	Arg	Ile	Cys	405	410	415
Val	Gly	Glu	Ala	Leu	Ala	Gly	Met	Glu	Leu	Phe	Leu	Phe	Leu	Thr	Ser	420	425	430
Ile	Leu	Gln	Asn	Phe	Asn	Leu	Lys	Ser	Leu	Val	Asp	Pro	Lys	Asn	Leu	435	440	445
Asp	Thr	Thr	Pro	Val	Val	Asn	Gly	Phe	Ala	Ser	Val	Pro	Pro	Phe	Tyr	450	455	460
Gln	Leu	Cys	Phe	Ile	Pro	Val	His	His	His	His						465	470	475

<210> 80

<211> 475

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: 2C9-FG
Loop-K206E

<400> 80

Met	Ala	Lys	Lys	Thr	Ser	Ser	Lys	Gly	Arg	Pro	Pro	Gly	Pro	Thr	Pro	
1				5					10					15		
Leu	Pro	Val	Ile	Gly	Asn	Ile	Leu	Gln	Ile	Gly	Ile	Lys	Asp	Ile	Ser	
			20					25					30			
Lys	Ser	Leu	Thr	Asn	Leu	Ser	Lys	Val	Tyr	Gly	Pro	Val	Phe	Thr	Leu	
		35					40					45				
Tyr	Phe	Gly	Leu	Lys	Pro	Ile	Val	Val	Leu	His	Gly	Tyr	Glu	Ala	Val	
	50					55					60					
Lys	Glu	Ala	Leu	Ile	Asp	Leu	Gly	Glu	Glu	Phe	Ser	Gly	Arg	Gly	Ile	
65					70					75					80	
Phe	Pro	Leu	Ala	Glu	Arg	Ala	Asn	Arg	Gly	Phe	Gly	Ile	Val	Phe	Ser	
				85					90					95		
Asn	Gly	Lys	Lys	Trp	Lys	Glu	Ile	Arg	Arg	Phe	Ser	Leu	Met	Thr	Leu	
			100					105					110			
Arg	Asn	Phe	Gly	Met	Gly	Lys	Arg	Ser	Ile	Glu	Asp	Arg	Val	Gln	Glu	
		115					120					125				
Glu	Ala	Arg	Cys	Leu	Val	Glu	Glu	Leu	Arg	Lys	Thr	Lys	Ala	Ser	Pro	
	130					135					140					
Cys	Asp	Pro	Thr	Phe	Ile	Leu	Gly	Cys	Ala	Pro	Cys	Asn	Val	Ile	Cys	
145					150				155					160		
Ser	Ile	Ile	Phe	His	Lys	Arg	Phe	Asp	Tyr	Lys	Asp	Gln	Gln	Phe	Leu	
				165				170						175		
Asn	Leu	Met	Glu	Lys	Leu	Asn	Glu	Asn	Ile	Glu	Ile	Leu	Ser	Ser	Pro	
			180				185						190			
Trp	Ile	Gln	Val	Tyr	Asn	Asn	Phe	Pro	Ala	Leu	Leu	Asp	Tyr	Phe	Pro	
		195					200					205				
Gly	Thr	His	Asn	Lys	Leu	Leu	Lys	Asn	Val	Ala	Phe	Met	Lys	Ser	Tyr	
	210					215					220					
Ile	Leu	Glu	Lys	Val	Lys	Glu	His	Gln	Glu	Ser	Met	Asp	Met	Asn	Asn	
225					230					235					240	
Pro	Gln	Asp	Phe	Ile	Asp	Cys	Phe	Leu	Met	Lys	Met	Glu	Lys	Glu	Lys	
				245					250					255		
His	Asn	Gln	Pro	Ser	Glu	Phe	Thr	Ile	Glu	Ser	Leu	Glu	Asn	Thr	Ala	
			260					265					270			
Val	Asp	Leu	Phe	Gly	Ala	Gly	Thr	Glu	Thr	Thr	Ser	Thr	Thr	Leu	Arg	
		275					280					285				
Tyr	Ala	Leu	Leu	Leu	Leu	Leu	Lys	His	Pro	Glu	Val	Thr	Ala	Lys	Val	
	290					295					300					

Gln Glu Glu Ile Glu Arg Val Ile Gly Arg Asn Arg Ser Pro Cys Met
 305 310 315 320
 Gln Asp Arg Ser His Met Pro Tyr Thr Asp Ala Val Val His Glu Val
 325 330 335
 Gln Arg Tyr Ile Asp Leu Leu Pro Thr Ser Leu Pro His Ala Val Thr
 340 345 350
 Cys Asp Ile Lys Phe Arg Asn Tyr Leu Ile Pro Lys Gly Thr Thr Ile
 355 360 365
 Leu Ile Ser Leu Thr Ser Val Leu His Asp Asn Lys Glu Phe Pro Asn
 370 375 380
 Pro Glu Met Phe Asp Pro His His Phe Leu Asp Glu Gly Gly Asn Phe
 385 390 395 400
 Lys Lys Ser Lys Tyr Phe Met Pro Phe Ser Ala Gly Lys Arg Ile Cys
 405 410 415
 Val Gly Glu Ala Leu Ala Gly Met Glu Leu Phe Leu Phe Leu Thr Ser
 420 425 430
 Ile Leu Gln Asn Phe Asn Leu Lys Ser Leu Val Asp Pro Lys Asn Leu
 435 440 445
 Asp Thr Thr Pro Val Val Asn Gly Phe Ala Ser Val Pro Pro Phe Tyr
 450 455 460
 Gln Leu Cys Phe Ile Pro Val His His His His
 465 470 475

<210> 81

<211> 494

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: 2C9 wild type
P450

<400> 81

Met Asp Ser Leu Val Val Leu Val Leu Cys Leu Ser Cys Leu Leu Leu
 1 5 10 15
 Leu Ser Leu Trp Arg Gln Ser Ser Gly Arg Gly Lys Leu Pro Pro Gly
 20 25 30
 Pro Thr Pro Leu Pro Val Ile Gly Asn Ile Leu Gln Ile Gly Ile Lys
 35 40 45
 Asp Ile Ser Lys Ser Leu Thr Asn Leu Ser Lys Val Tyr Gly Pro Val
 50 55 60
 Phe Thr Leu Tyr Phe Gly Leu Lys Pro Ile Val Val Leu His Gly Tyr

65	70					75					80				
Glu	Ala	Val	Lys	Glu	Ala	Leu	Ile	Asp	Leu	Gly	Glu	Glu	Phe	Ser	Gly
				85					90					95	
Arg	Gly	Ile	Phe	Pro	Leu	Ala	Glu	Arg	Ala	Asn	Arg	Gly	Phe	Gly	Ile
			100					105					110		
Val	Phe	Ser	Asn	Gly	Lys	Lys	Trp	Lys	Glu	Ile	Arg	Arg	Phe	Ser	Leu
		115					120					125			
Met	Thr	Leu	Arg	Asn	Phe	Gly	Met	Gly	Lys	Arg	Ser	Ile	Glu	Asp	Arg
	130					135					140				
Val	Gln	Glu	Glu	Ala	Arg	Cys	Leu	Val	Glu	Glu	Leu	Arg	Lys	Thr	Lys
145					150					155					160
Ala	Ser	Pro	Cys	Asp	Pro	Thr	Phe	Ile	Leu	Gly	Cys	Ala	Pro	Cys	Asn
				165					170					175	
Val	Ile	Cys	Ser	Ile	Ile	Phe	His	Lys	Arg	Phe	Asp	Tyr	Lys	Asp	Gln
			180					185					190		
Gln	Phe	Leu	Asn	Leu	Met	Glu	Lys	Leu	Asn	Glu	Asn	Ile	Lys	Ile	Leu
		195					200					205			
Ser	Ser	Pro	Trp	Ile	Gln	Ile	Cys	Asn	Asn	Phe	Ser	Pro	Ile	Ile	Asp
	210					215					220				
Tyr	Phe	Pro	Gly	Thr	His	Asn	Lys	Leu	Leu	Lys	Asn	Val	Ala	Phe	Met
225					230					235					240
Lys	Ser	Tyr	Ile	Leu	Glu	Lys	Val	Lys	Glu	His	Gln	Glu	Ser	Met	Asp
			245						250					255	
Met	Asn	Asn	Pro	Gln	Asp	Phe	Ile	Asp	Cys	Phe	Leu	Met	Lys	Met	Glu
			260					265					270		
Lys	Glu	Lys	His	Asn	Gln	Pro	Ser	Glu	Phe	Thr	Ile	Glu	Ser	Leu	Glu
		275					280					285			
Asn	Thr	Ala	Val	Asp	Leu	Phe	Gly	Ala	Gly	Thr	Glu	Thr	Thr	Ser	Thr
	290					295					300				
Thr	Leu	Arg	Tyr	Ala	Leu	Leu	Leu	Leu	Leu	Lys	His	Pro	Glu	Val	Thr
305					310					315					320
Ala	Lys	Val	Gln	Glu	Glu	Ile	Glu	Arg	Val	Ile	Gly	Arg	Asn	Arg	Ser
			325						330					335	
Pro	Cys	Met	Gln	Asp	Arg	Ser	His	Met	Pro	Tyr	Thr	Asp	Ala	Val	Val
			340					345					350		
His	Glu	Val	Gln	Arg	Tyr	Ile	Asp	Leu	Leu	Pro	Thr	Ser	Leu	Pro	His
		355					360					365			
Ala	Val	Thr	Cys	Asp	Ile	Lys	Phe	Arg	Asn	Tyr	Leu	Ile	Pro	Lys	Gly

370					375					380					
Thr	Thr	Ile	Leu	Ile	Ser	Leu	Thr	Ser	Val	Leu	His	Asp	Asn	Lys	Glu
385					390					395					400
Phe	Pro	Asn	Pro	Glu	Met	Phe	Asp	Pro	His	His	Phe	Leu	Asp	Glu	Gly
				405					410					415	
Gly	Asn	Phe	Lys	Lys	Ser	Lys	Tyr	Phe	Met	Pro	Phe	Ser	Ala	Gly	Lys
			420					425					430		
Arg	Ile	Cys	Val	Gly	Glu	Ala	Leu	Ala	Gly	Met	Glu	Leu	Phe	Leu	Phe
		435					440					445			
Leu	Thr	Ser	Ile	Leu	Gln	Asn	Phe	Asn	Leu	Lys	Ser	Leu	Val	Asp	Pro
	450					455					460				
Lys	Asn	Leu	Asp	Thr	Thr	Pro	Val	Val	Asn	Gly	Phe	Ala	Ser	Val	Pro
465					470					475					480
Pro	Phe	Tyr	Gln	Leu	Cys	Phe	Ile	Pro	Val	His	His	His	His		
			485					490							

<210> 82
 <211> 40
 <212> PRT
 <213> Homo sapiens

<400> 82
 Met Asp Ser Leu Val Val Leu Val Leu Cys Leu Ser Cys Leu Leu Leu
 1 5 10 15
 Leu Ser Leu Trp Arg Gln Ser Ser Gly Arg Gly Lys Leu Pro Pro Gly
 20 25 30
 Pro Thr Pro Leu Pro Val Ile Gly
 35 40

<210> 83
 <211> 21
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> Description of Artificial Sequence: 2C9 and 2C19
 truncation

<400> 83
 Met Ala Lys Lys Thr Ser Ser Lys Gly Arg Pro Pro Gly Pro Thr Pro
 1 5 10 15
 Leu Pro Val Ile Gly
 20

<211> 40

<212> PRT

<213> Homo sapiens

<400> 84

Met Asp Pro Phe Val Val Leu Val Leu Cys Leu Ser Cys Leu Leu Leu

Leu Ser Ile Trp Arg Gln Ser Ser Gly Arg Gly Lys Leu Pro Pro Gly

Pro Thr Pro Leu Pro Val Ile Gly

35

40